

What is claimed is:

1. A method for anisotropically etching a feature in a substrate comprising the steps of:

subjecting the substrate to an alternating cyclical process within a plasma chamber, said alternating cyclical process having an etching step and a deposition step; and

pulsing an inductively coupled plasma source during the etching step of the alternating cyclical process.

2. The method of claim 1 further comprising the step of providing a bias voltage to the substrate.

3. The method of claim 2 further comprising the step of pulsing the bias voltage.

4. A method of etching a feature in a silicon substrate provided on an insulating layer as part of a cyclical deposition/etching process, said method comprising etching the substrate with an inductively coupled plasma from an inductively coupled plasma source while pulsing the inductively coupled plasma source.

5. The method of claim 4 further comprising the step of providing a bias voltage to the substrate.

6. The method of claim 5 further comprising the step of pulsing the bias voltage provided to the substrate.

7. The method of claim 6 wherein the bias voltage is pulsed in phase with the pulsing of the inductively coupled plasma source.

8. The method of claim 6 wherein the bias voltage is pulsed out of phase with the pulsing of the inductively coupled plasma source.

9. The method of claim 6 wherein the bias voltage is at an RF frequency.

10. The method of claim 6 wherein the bias voltage is pulsed d.c.

11. The method of claim 4 wherein the step of etching the substrate further comprises only pulsing the inductively coupled plasma source when the insulating layer is exposed.

12. The method of claim 4 wherein a pulse width of an on state of the pulsed inductively coupled plasma source is selected such that charge build up does not reach a steady state.

13. The method of claim 4 wherein a pulse width of an on state of the pulsed inductively coupled plasma source is less than a few milliseconds.

14. A method of constructing a structure on a substrate, said method comprising alternatively performing a deposition step and an etching step wherein an inductively coupled plasma source is pulsed during the etching step to prevent notching.

15. The method of claim 14 further comprising the step of providing a bias voltage to the substrate.

16. The method of claim 14 further comprising pulsing the bias voltage.

17. The method of claim 16 wherein the bias voltage is pulsed in phase with the pulsing of the inductively coupled plasma source.

18. The method of claim 16 wherein the bias voltage is pulsed out of phase with the pulsing of the inductively coupled plasma source.

19. The method of claim 15 wherein the step of pulsing the inductively coupled plasma source further comprises pulsing the inductively coupled plasma source when the etching step exposes an insulating layer.

20. The method of claim 15 wherein a pulse width of an on state of the pulsed inductively coupled plasma source is selected such that charge build up on the substrate does not reach a steady state.